regarded from the significance of its etymology, — the love of wisdom. Lessing said, that, if it were necessary to choose, he would prefer to have the love of truth to the possession of truth itself. By this paradox he meant to emphasize his desire for wisdom, not for repletion by facts and cold encyclopedic knowledge. The mere possession of truth, not strictly wisdom, may be that of a miser who hoards and does not circulate it to the common good; but the love of wisdom brings wisdom. "Be there a will, and wisdom finds a way." "Wisdom crieth aloud, she uttereth her voice in the streets," and it will be regarded. "So teach us to number our days that we may apply our hearts unto wisdom."

SCIENTIFIC NEWS IN WASHINGTON.

Causes of Configuration in Trees. — How Some Eskimo Measure. — A New Improved Freezing-Microtome.

Causes of Configuration in Trees.

THE influences under which a tree assumes one shape instead of another are obscure even to the students of vegetable dynamics. External forces are added to hereditary forces in every growth. The mechanical forces at work, affecting plants externally, are mainly gravity and atmospheric pressure (wind).

B. E. Fernow, chief of the forestry division of the national Department of Agriculture, recently read a paper setting forth some valuable observations.

The physiological forces are termed 'stimuli,' and produce re-actions only on the growing tissue, and are characterized by the disproportionality between the external stimulus and the ultimate re-action. These forces work accidentally and occasionally, often changing the environment of an organ; and such alterations may occur by a change in the intensity or direction of the light, variation of temperature, instantaneous shocks, sudden pressure, etc. The capacity to re-act to these stimuli is called 'irritability,' the presence or absence of which is a sign of life or death.

The various parts of a plant re-act differently to the same stimulus, and according to their type of structure. The internal capacity of a part of an organ to re-act to external influences determines its external form and the direction of growth: thus radial structures are usually orthotrop (tending to place their axis toward the acting force), dorsiventral structures act plagiotropically (tending to place their axis obliquely or transverse to the direction of the acting force).

But there is also seen what may be termed a vicarious correlation' of the different structures, by which the development of one organ is changed in its direction by the development or lack of development of the other; thus, also, a plagiotropic organ becomes orthotrop. The most common example of this correlation is seen when the main axis is cut off, and a side-branch takes the orthotropic nature of the main axis.

The stimuli that effect changes of direction in various parts of plants — aside from accidental ones, like pressure, contact, moisture, heat — are mainly light and gravity; the re-action to light being termed 'heliotropism,' and that to gravity being 'geotropism.' In regard to the latter re-action, there appears to be a misapprehension as to the nature of gravitation, as usually accepted, and as stated by Sachs, Darwin, Wiesner, and others.

It seems illogical to assume that gravity, conceived to act everywhere and constantly, could be considered as determining the direction of the primary root vertically downward, of the secondary roots obliquely downward, and of the other classes of roots growing without reference to this always active force.

That the direction of the different parts is a resultant of several forces, among which gravity may be one, is hardly intimated by these writers; and the dominion of gravity is so forcibly stated that the occasional reference to modifying influences does not impress us as a necessary and important consideration.

The effects of heliotropic (light) stimulations are the opposite from those called 'geotropic,' or a bending toward the light. But the effect of light upon root-forming matter is to turn it away from the light; and upon shoot-forming matter, to turn it toward the light; while dorsiventral structures adjust themselves obliquely across the direction in which the light strikes the irritable organ. The latter behavior is highly important, and reveals the purpose of this re-action, which results in the largest surface of chlorophyl-bearing cells being exposed to the light, and inducing the chemical changes upon which growth depends.

Intensity of light, however, may become injurious, and hence the presence in some plants (*Mimosa*) of an ability to change the position of the leaves with reference to the optimum light intensity. As the light is diffused equally in the atmosphere, a re-action is produced only by a difference in the amount of light which reaches the different sides of a growing part. The direction, then, of a branch, as far as it is dependent on the action of light, is in proportion to the difference of illumination of its parts; for a greater illumination on one side of a branch has the effect of increasing the cell-growth on the shaded side (hyponasty), and thus the more rapid lengthening of the shaded side results in a curvature and a new direction of the tip of the branch toward the light. The action of light on the roots is exactly opposite (epinasty); i.e., the illuminated part lengthens more rapidly, carrying the growing point away from the light.

Considering the action of the light on the normal development of the branch system, concludes Mr. Fernow, we can better understand how the direction of branches is changed from their original position to the one in which we find them in later life; and we can also understand that the typical branch system of trees must to some extent depend on the greater or less density of foliage. Thus less dense foliaged trees should in general exhibit a more erect habit in their branches; while the shadiest foliage should give the most spreading branch system.

How Some Eskimo Measure.

The ape which (or perhaps whom) Mr. Romanes has succeeded in teaching to count five seems to tread closely on the heels of some of the races of men. In a paper on the Eskimo of Point Barrow, Mr. John Murdoch of the National Museum said, that, like the rest of those peoples, they ordinarily do not use numbers greater than five, but speak of six and all higher numbers as 'many.' Their real numbers are one, two, three, four, five, ten (which means the upper part of the body, namely, the number of digits on the upper extremities), fifteen (perhaps), and twenty (which means 'a man complete,' i.e., all his digits used up). These numbers are almost identical with those used in the other dialects, while the intermediate numbers are quite different, though expressed in a similar manner; that is to say, 'so many on the next hand or foot.'

With such clumsy numerals, arithmetical processes are practically impossible, though they practise a sort of crude addition, arriving at the number of a large series of objects by grouping them together in fives. In counting, the ordinal numerals are used. This is also the same as in the other dialects.

They originally had no standard of dimensions for space, but of late years have learned to use the fathom in trading for cloth, etc.

Time is measured by the sun and stars. For example: the star Arcturus is the seal-netters' timepiece. When he is in the east, dawn is near, and it is time to stop fishing. The year is divided into four seasons, — early winter, winter, early summer, and summer.

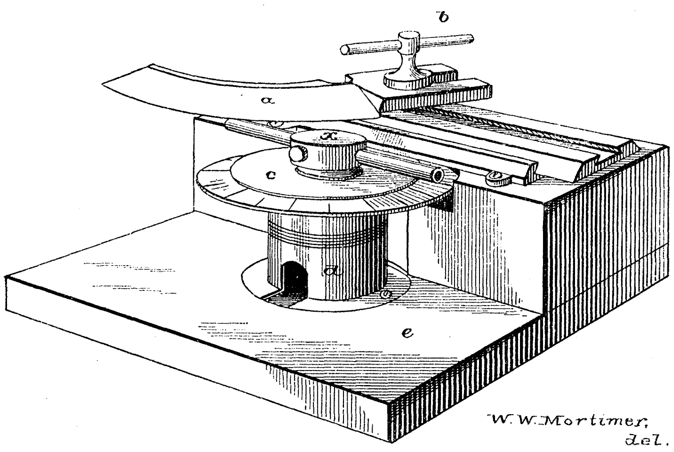
Nine lunar months are known by name. The rest of the year "there *is* no moon, only the sun." They begin to count the moons from the early autumn, the time when the women go off into the little tents to work on deer-skins. The first moon — roughly speaking, October — is "the time for working, i.e., sewing;" November, "the second time for sewing;" December, "the time for dancing" (this is the season of the great semi-dramatic festivals); January, "great cold," or "little sun" (in this moon the sun just re-appears at noon); February, "the time for starting" (on the winter deer-hunt); March, "the time for starting home;" April, "the time for making ready the boats" (for whaling); May, "the time for fowling;" and June, "the time for bringing forth young" (when the birds lay eggs).

They clearly distinguish "to-day," "yesterday," and "to-morrow;" but "day before yesterday" and "day after to-morrow" are the same; and beyond that, all is "some time ago" or "some time hence" (the same word), till it gets to be "long ago" or "by and by."

Then there are no dates in their past or future, except what has happened or is to happen.

Dr. Thomas Taylor's New Improved Freezing-Microtome, adapted to Three Methods of Section-Cutting.

Dr. Thomas Taylor of the Agricultural Department, who several years ago invented a microtome, which was described and illustrated in *Science*, gave the first public exhibition of a new microtome at the last meeting of the Microscopical Society of Washington. The following diagram and description will show the advantages claimed for it. It may also be added that it is simpler, and can be manufactured at much less cost, than the microtomes now generally in use; and, as those persons employed by the government are not allowed to patent inventions made in the line of the work they are engaged in, any microscopist in the country may make and use the instrument here described.



a, curved knife, adjustable at any angle; *b*, binding-screw; *c*, graduated disk, which revolves on stand (*d*) by means of a finely cut screw-thread; *e*, mahogany stand upon which the instrument is secured.

A cork with a central opening is fitted into a descending tube (one inch deep, by one and a half inches in diameter) in the centre of disk (*c*). Cork and tube revolve with the disk. In the central opening is fitted an ordinary stopper or cork, on top of which the object to be shaved may be secured by paraffine or wax.

In order to freeze objects, remove the central cork, and insert the hollow metal box (*x*), a prolongation of which fits into the hollow cork in disk (*c*). Two tubes of metal project from the freezing-box, — one to admit water, the other to allow it to flow out. The water is supplied and carried off by means of rubber tubing attached to the metal tubes, the terminal end of the rubber tube which carries off the water being contracted to control the flow.

In the use of ether as a means of freezing objects for the cutter, remove the plug in front of the freezing-box, and detach the rubber tubing. Apply ether in the usual manner.

ETHNOLOGY.

Tales from Venezuela.

DR. A. ERNST, who has done so much to increase our knowledge of Venezuelan ethnology, has collected a few popular tales, which are very interesting on account of their Tupi and Spanish affinities. The tales are entitled 'Tio Tigre and Tio Conejo' ('Uncle Tiger and Uncle Rabbit'), and all of them have for their subject the superiority of cunning and craft over sheer force. We give here translations of a few of these tales.

"Uncle Tiger had a field of splendid watermelons. He observed that somebody visited his field at night, and stole the melons: therefore he made a figure of a man of black wax, and placed it in the field. At night Uncle Rabbit came, and saw the figure. 'What are you doing there, you black man? Get away!' The figure did not reply. Then Uncle Rabbit went up to the black man and boxed his ears; but his right hand stuck to the wax. 'Let go my hand, or I'll box your other ear!' cried he. When he did so, his left hand also stuck to the wax. Then he knocked his head against the forehead of the figure: his head stuck to it. Then he worked with his hind-legs to get away: they also stuck to the wax, and Uncle Rabbit was caught. Early in the morning Uncle Tiger came, and when he saw Uncle Rabbit, he cried, 'Oho! have we got the thief? Now I'll eat you!' — 'Wait a moment,' said Uncle Rabbit; 'set me free, and I will show you a pit in which two large deer have been caught. You had better eat those.' Uncle Tiger thought, 'Two large deer are better than Uncle Rabbit,' and he set him free. Uncle Rabbit led him to a deep pit, and said, 'Stoop down, and you will see the deer.' When Uncle Tiger did so, Uncle Rabbit pushed him from behind, and Uncle Tiger fell into the pit. Uncle Rabbit, however, ran away as fast as his legs would carry him."

Here is another story: "Uncle Rabbit was very sad because he was so small. He went to God, and wanted to be made taller. God said, 'I will do so, but first bring me a coral snake, a wasp swarm, and a calabash filled with women's tears.' Uncle Rabbit started on his journey, and arrived in a forest where there were many snakes. Walking along there, he said, 'I bet there is room for him, I bet there is room for him!' A coral snake heard him, and asked what his speech meant. He replied, 'The wasps say that there is not room enough for you in this calabash, and I bet that you can get in there.' — 'We will see at once who is right,' said the snake, and crawled into the calabash. When he was in it, Uncle Rabbit at once put the stopper into the opening, and thus the snake was caught. Then he went on, and said, 'I bet there is room for them, I bet there is room for them.' The wasps heard him, and asked what his speech meant. 'Oh!' said Uncle Rabbit, 'the snake says there is not room enough for your swarm in this calabash, and I bet that all of you can get in there.' — 'We will see at once who is right,' said the wasps, and crawled into the calabash. When the whole swarm was in, Uncle Rabbit put the stopper into the opening, and thus the wasps were caught. He next went to a village, and when near the huts he began to cry and lament. Then all the women gathered, and asked the cause of his grief. 'Oh!' said Uncle Rabbit, 'why should I not cry and lament? The world is going to be destroyed to-day, and all of us will perish.' When the women heard this, they began to cry wofully, and Uncle Rabbit filled a calabash with their tears. Then he returned to God. When the latter saw the three calabashes with the snake, the wasps, and the tears, he said, 'Uncle Rabbit, you are more cunning than any one else. Why do you want to be taller? But as you wish it, I will at least make your ears larger.' Saying so, he pulled Uncle Rabbit's ears, and since that day they have remained long."

The Races of the Babylonian Empire.

In a recent number of the Journal of the Anthropological Institute, Mr. G. Bertin publishes an interesting study of the types of man found on Babylonian monuments. One of the most remarkable results of his researches is the proof that the Armenian race of these early times exhibits the same characteristics to be noticed in the modern Armenians (Fig. 3). This is the more remarkable from the fact that at this period the language spoken in Armenia, and illustrated by the inscriptions of Van, is totally different from Armenian, and linguistically connected with Akkadian and Medic. Evidently the Armenian population has, in course of time, acquired a new language, while its physical characteristics survive. Dr. von Luschan has shown that the Turks and Greeks of Asia Minor are of the same Armenian type, and thus the great antiquity of the native population of this region is proved.

Conclusions derived from types represented on ancient monuments cannot be of the same value as craniological researches; the individuality of the artist, the conventionalism of art, and the object of the monument having a ruling influence upon the character of the representations. Captive enemies will not be represented in the same way as a victorious king and his allies. Nevertheless a variety of types may readily be recognized, as the artists undoubtedly represent typical individuals. A few figures from the plate accompanying Mr. Bertin's paper have been reproduced here. It will be noted that the faces are represented in profile, with eyes in full face. Figs. 2, 4, 5, and 6 are of peculiar interest. The persons represented resemble the types of figures on Assyrian monuments showing people of inferior condition. Fig. 2 is taken from an Assyrian monument. The head is small and round, the forehead low and slanting, the cheek-bones high, the lips thin, and the chin